



# Mount Rainier National Park

## Sister Mountain Project

### Life Zones Rummy

<b>Overview</b>	All life depends on a habitat's food, water, shelter, and space to live. In this game, students ensure the survival of an animal by gathering these components and who ever saves the most animals wins. Student created cards will be used to play Gin-Rummy and familiarize students with the different components of a habitat needed for an organism to survive on Mt. Rainier.
<b>Grade Level</b>	6-12
<b>Objectives</b>	<ul style="list-style-type: none"><li>• Identify components of habitat as food, water, shelter and space in a suitable arrangement.</li><li>• Apply knowledge of these components to habitat requirements for species at Mt. Rainier.</li></ul>
<b>Setting</b>	Classroom
<b>Timeframe</b>	A 50-minute period to introduce the concepts of habitat and to create the cards, then 1 50-minute period to play the game and wrap up with the evaluation.
<b>Materials</b>	<ul style="list-style-type: none"><li>✓ Writing paper</li><li>✓ Pencils</li><li>✓ Drawing paper</li><li>✓ Construction paper</li><li>✓ Scissors</li><li>✓ Glue</li><li>✓ Chalkboard (or copies of master cards for those who want to eliminate the research phase)</li></ul>
<b>Vocabulary</b>	
<b>Standards</b>	<p>6-8 LS2A An <i>ecosystem</i> consists of all the <i>populations</i> living within a specific area and the nonliving <i>factors</i> they interact with. One geographical area may contain many <i>ecosystems</i>.</p> <p>6-8 LS2B Energy flows through an <i>ecosystem</i> from <i>producers</i> (plants) to <i>consumers</i> to <i>decomposers</i>. These <i>relationships</i> can be shown for specific <i>populations</i> in a <i>food web</i>.</p>

	<p>6-8 SYSA Any <i>system</i> may be thought of as containing <i>subsystems</i> and as being a <i>subsystem</i> of a larger <i>system</i></p> <p>6-8 SYSB The boundaries of a <i>system</i> can be drawn differently depending on the features of the <i>system</i> being <i>investigated</i>, the size of the <i>system</i>, and the purpose of the <i>investigation</i>.</p> <p>6-8 SYSF The <i>natural</i> and <i>designed world</i> is complex; it is too large and complicated to <i>investigate</i> and comprehend all at once. Scientists and students learn to define small portions for the convenience of <i>investigation</i>. The units of <i>investigation</i> can be referred to as "<i>systems</i>."</p>
<p><b>Background</b></p>	<p>All living things, from wildlife to pets to humans, have some of the same basic needs. Every living thing needs a "home," or habitat. An organism's habitat includes food, water, shelter or cover, and space. Mt. Rainier provides a great variety of habitats that a range of plants and animals call home. The following is some information about the different habitats, or life zones, and the animals and plants that can be found in these habitats.</p> <p>The elevation of Mount Rainier spans from 450 meters at the base to 4,392 meters at the summit. For every 300 meter increase in elevation the temperature drops about 15° Celsius. You can go from a temperate world of moderate temperatures to the Arctic tundra simply by climbing the mountain. This wide elevation range supports a corresponding variation in vegetation and wildlife. Belts of similar vegetation are referred to as life zones. There are four main life zones in Mount Rainier National Park, although no sharp boundaries separate them and species overlap. Following is a brief description of each zone.</p> <p><b><i>Low-Elevation Forest</i></b>  <i>518-762 meters</i></p> <ul style="list-style-type: none"> <li>• Mature (up to 1,000 years old) forests of large, old conifers, both living and dead (dead trees are called snags if standing, nurse logs if fallen)</li> <li>• Very little sunlight reaches the forest floor; thick ground cover of smaller plants such as mosses, ferns, fungi and flowers</li> <li>• Dense, multi-layered canopy; with the topmost canopy level reaching up to 60 meters; sparse understory of shade tolerant trees; fair number of shrubs</li> <li>• Animal and plant species are very diverse, and the majority of different species can be found here</li> </ul> <p><i>Trees:</i> Douglas-fir, western red cedar, western hemlock, grand fir  <i>Understory plants:</i> vine maple, devil's club, Oregon grape, salal, sword fern  <i>Birds:</i> owls (great horned owl, western screech owl, etc.); woodpeckers (northern flicker and hairy woodpecker); and jays (grey jay and Steller's jay)  <i>Mammals:</i> bats (<i>Yuma myotis</i> and long-legged <i>myotis</i>), rodents (long-tailed</p>

vole and northern flying squirrel); black-tailed deer, raccoons, mountain lions  
*Other:* Northwestern garter snake, gopher snake, Pacific tree frog, banana slugs

### ***Mid-Elevation Forest***

*762-1,220 meters*

- More open areas and less Douglas fir and western hemlock.
- Sparser understory; heavier shrub layer
- More barren forest floor (less moss)

*Trees:* pacific silver fir, noble fir,

*Understory:* Huckleberry (Alaska, black, oval-leaf, and red), bunchberry, rhododendron, goats beard, tiger lily

*Birds:* yellow-rumped warbler, chipping sparrow, northern harrier

*Mammals:* elk, black bear, red fox, bobcat, marten, heather vole

### ***Subalpine Forest and Meadow***

*1,220-1,981 meters*

- Areas of low vegetation mixed with clumps of trees, large scree fields
- Severe climate and a short growing season results in little annual woody growth
- Trees are small and narrow; branches flex to shed heavy snows

Meadows covered in snow most of the year, but in mid-summer melt out and reveal beautiful wildflowers.

*Trees:* subalpine fir, mountain hemlock, Alaska yellow cedar

*Flowers:* lupines, avalanche lilies, paintbrush, bistort, heather, etc.

*Mammals:* mountain goats, marmots, snowshoe hare

*Birds:* blue grouse and Clark's nutcracker, red-tailed hawk

*Other:* bumble bees, flies, Cascade frog

### ***Alpine***

*1,981-4,392 meters*

- Also known as tundra
- A harsh, rocky landscape above tree line with uniquely adapted, hardy plants that take on the Krummholz (a German word for crooked or twisted) form, shrubs and smaller plants take on pin cushion form "huddling" together to create more heat
- Freezing temperatures and gale force winds
- Perpetual ice and snow found above fell fields (stone "fields", less than half covered with plants)

*Plants:* heather, lupine, algae, lichens, watermelon snow

*Mammals:* deer mice, pika

*Birds:* white-tailed ptarmigan

*Other:* Vidler's alpine, ice worms

## Procedure

### Preparation of Cards

1. Arrange students in groups of two or three. Have each student pick an animal or plant to research from the list of the life zone information, make a master list to make sure there are not repeats.
2. Ask the student in each group to use reference materials to research their animal. The internet or guide books (see references) are ideal for students to find the information for themselves. If those aren't available see the student handout sheet attached with this lesson. Research should include the organism's food, water, shelter, and space needs. They also should find out where the animal lives. For example, if the students pick a mountain goat, they should find out that a mountain goat eats any type of leafy foliage, lichens, and subalpine fir needles, gets their water from mountain springs and glacier runoffs, and finds shelter on rocky mountainsides with cliff over hangings.
3. Make a large master Habitat Information Chart, that includes the major categories of information found by the each of the students, *for example:*

	Mountain Goat	Red-Tailed Hawk	Beargrass	White-Tailed Ptarmagin
Food	Shrubs, lichens, fir needles	Rodents	Sunlight, nitrogen, minerals	Seeds and insects
Water	Streams, ponds, snow	From food, stream, ponds	Melted snow, rainwater, and dew	Glacial streams
Shelter	Rocky Cliffs	Found near deciduous trees	Snow	Rocky outcroppings and subalpine firs

	<table><tr><td>Life Zone on Mt. Rainier</td><td>Subalpine to Alpine Forest</td><td>Low- elevation to subalpine forest</td><td>Mid- elevation forest</td><td>Alpine</td></tr></table> <p>4. Then have students design cards on a 8x10 sheet of paper, divided into 8 squares on the whole sheet, where each card has the name of the animal and a category from the master Habitat Chart and a picture designing the card. Each student designs 4 of the 8 cards. Then make copies where each group of two to three students has a complete set of all cards. Students can then cut out the cards and glue onto 3x5 cards or heavy duty construction paper.</p> <p>Playing the Game</p> <p>5. The object of the game is for a player to acquire five cards from the one vertical column or a complete set of habitat components for each animal as listed on the master Habitat Information Chart. The game ends when all cards for each organism has been collected. The student having the greatest number of complete organism sets wins. Every group of two to three students playing the game uses one complete set of habitat cards, and each group has a winner. Even though the game is based on luck, students get familiar with the habitat components. It is helpful for the students if you post the master Habitat Information chart on the board for all students to see.</p> <p>6. To start the game, a student in the group deals five cards to each player and the leftover cards are placed in a pile in the center of the table and becomes the draw pile. The first player discards an unwanted card (by making a pile next to the draw pile) and then picking the top card in the draw pile so that the player always has five cards in their hand. The next player repeats this process, and play continues until a player acquires a complete set of habitat cards for an organism. The master Habitat Information Chart can serve as a reference in the process. When a player acquires a full set he or she yells that animal! This process continues until all habitats are complete and the student in each group with the most complete organism sets wins, and the winners of each group could compete for class champion.</p>	Life Zone on Mt. Rainier	Subalpine to Alpine Forest	Low- elevation to subalpine forest	Mid- elevation forest	Alpine
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<b>Suggested Assessment</b>	<p>1. List all the habitat needs for any animal found on Mt. Rainier.</p> <p>2. Write a story that describes the day in the life of an organism on</p>					

	Mt. Rainier as it finds all the components needed in its habitat.
<b>Adaptations</b>	<ul style="list-style-type: none"> <li>• To make the game a little more challenging give each group two sets of all the cards so that they have to put a little more thought into collecting one of each of the five categories.</li> <li>• Showdown Challenge: Deal out all cards equally to each player. When the dealer says go, each player flips over one of their cards onto the table. If a one card is a predator and the player who flipped that card slaps the center of the table first, then that player gets all the cards. The predator card does not necessarily have to prey on that particular organism card, its just if the predator is higher up on the food chain then the other cards. If a player who flips over a card that would be considered prey slaps the center of the table before the predator, that player has “outsmarted” the predator and gets to collect all the cards. If all cards are predators or all cards are prey then the cards go in a discard pile. If a person slaps the center table in this scenario then they have slapped incorrectly and must give cards to the other player. The person, after a certain amount of time, with the most cards wins.</li> </ul>
<b>Extensions</b>	See Wild Wapiti
<b>References/ Resources</b>	<p>Council for Environmental Education. (2008). <i>Project Wild: K-12 Curriculum and Activity Guide</i>. Houston, TX: Author.</p> <p>Mathews, Daniel. (1999). <i>Cascade-Olympic Natural History: A Trailside Reference</i>. Portland, OR: Raven Editions.</p> <p>Wuerthner, George. (2000). <i>Mount Rainier: A Visitor's Companion</i>. Mechanicsburg, PA: Stackpole Books.</p>